CLAIMS

~~Having thus described my invention, what I claim as new and desire to secure by Letters Patent is as follows:~~

1. A method of measuring overlay alignment of sequential lithographic exposures, said method including steps of

forming first separated features on a surface,

forming second separated features on said surface interleaved between said first separated features, and

illuminating said first and second separated features and detecting an interference pattern.

2. A method as recited in claim 1, including the further step of calculating a spectrographic response corresponding to said interference pattern.

3. A method as recited in claim 1, wherein said illuminating and detecting step is performed with a specular spectroscopic scatterometer.

4. A method as recited in claim 3 wherein said scatterometer is of the reflectometer type.

5. A method as recited in claim 3 wherein said scatterometer is of the ellipsometer type.

6. A method as recited in claim 5, wherein said ellipsometer measures complex reflectivity spectral ratio for two orthogonal polarizations with broadband illumination.

7. A method as recited in claim 1 wherein said illumination is broadband light.

8. A metod as recited in claim 1 wherein said detection measures amplitude and phase.

9. A method as recited in claim 1, wherein said illumination and detection step results in measured spectral curves and including the further steps of

modelling said first and second features by simulation to obtain simulated spectral curves, and

comparing said measured spectral curves with said simulated spectral curves.

10. A method as recited in claim 9, wherein said comparing step includes use of an optimization technique to determine best fit and to quantify a misalignment value.

11. A test mark including

a plurality of marks formed by a lithographic exposure,

a mark formed between said plurality of marks by another lithographic exposure,

said mark and said plurality of marks forming a periodic structure.

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12. A non-imaging metrology apparatus comprising

means for storing spectral curves,

a specular spectroscopic scatterometer for measuring reflection from a plurality of marks formed by two lithographic exposures and forming a periodic structure, and

means for comparing processed signals output from said specular spectroscopic scatterometer with said spectral curves to evaluate misalignment of said two lithographic exposures.